

OPERATION MANUAL

MODEL NO: CHV1-UP

MODEL NO: CHV1-UP-US

Nintendo[®]

-WARNING -

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rulès, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

-WARNING -

Use of non-Nintendo parts or modifications of your Nintendo game circuitry may adversely affect the safety of your game, and may cause injury to your players.

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1. Location Setup

A. Game Inspection

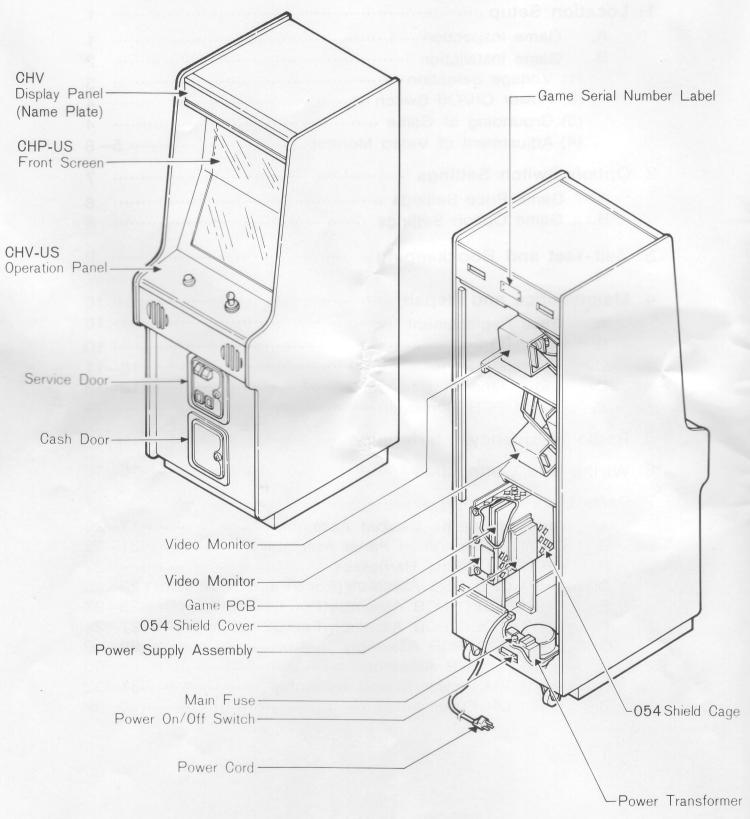


Fig. I Game Overview

-WARNING-

Check before plugging the game in!

The game "Arm Wrestling" is shipped ready for operation, but a last visual check should be made to insure the final touch of quality control. Please check the following to help us insure that your new game was delivered to you in good condition.

- (1) Check the exterior of the game for shipping damage, dents, chips, or broken parts.
- (2) Remove the screws on the Rear Door Panel.
- (3) Unlock and open the Rear Door Panel, as well as the Service Door inspect the interior of the game as follows:
 - (a) Check that Plug-in connectors are firmly connected.
 - (b) Check that Plug-in integrated circuits on the Game PCB are firmly connected in their sockets.
 - (c) Check that all major subassemblies such as the Power Supply, Operation Panel, and Video Monitor are properly mounted.
 - (d) Remove the tie-wrap that holds the coiled Power Cord on the inside cabinet wall. Check the cord for any cuts or dents in the insulation.

B. Game Installation

Fig. 2 Installation Requirements

Power		170 watts
Temperature	:	0 to 38 deg.C (32 to 100 deg.F)
Humidity		Not over 95% relative

Space required: $63 \text{ (W)} \times 90 \text{ (D)} \text{ cm} (24 3/4 \times 35 1/2 in.)$

Height: 189 cm (74 1/2 in.)

(1) Voltage Selection

Before plugging in your game, make sure the Terminal Block of the Power Transformer is correct for your location's line voltage.

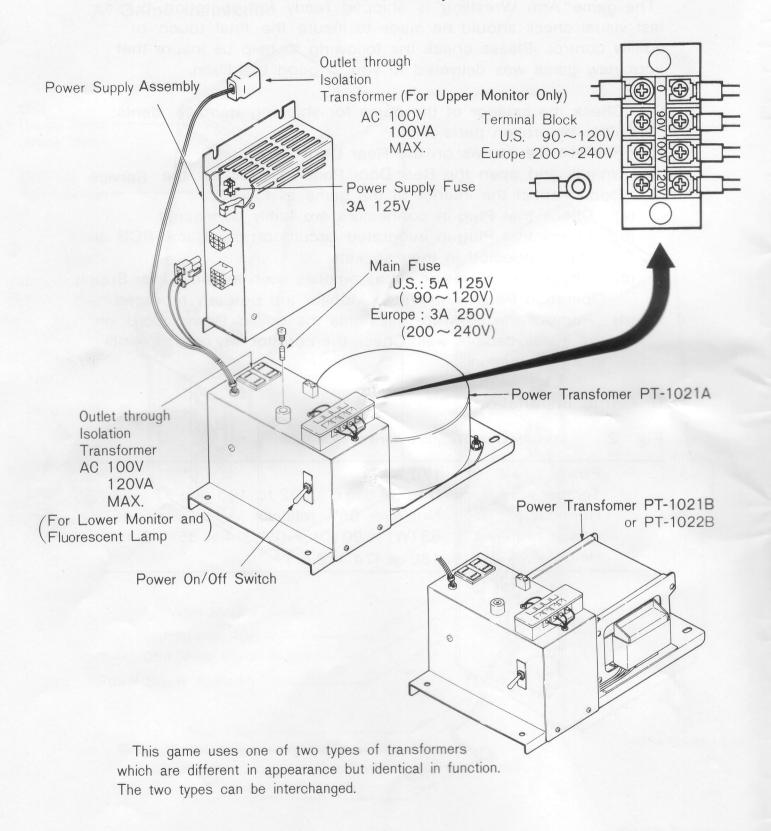


Fig. 3 Power Supply Assembly, Power Transformer and Voltage Selection

(2) Power On/Off Switch

A Power On/Off Switch is located in the rear of the game at the bottom center of the cabinet. See Fig. 1.

If the results of the preceding steps are satisfactory, you are ready to plug the game in, and set the Power On/Off Switch to the "On" position.

-WARNING-

This game MUST be grounded. Failure to do so may result in destruction of electronic components.

(3) Grounding of Game (Use only if 3 wire outlet is unavailable.) See Fig. 4

- (a) A grounding wire should be connected to a grounding bar or a metal pipe which is firmly inserted into the ground.
- (b) Do not connect the grounding to a water pipe, because polyvinyl-chloride pipes are sometimes used in water lines, and the electronic continuity to the ground may be interruppted.
- (c) Absolutely do not connect the grounding wire to a gas pipe, as this can be extremely dangerous.

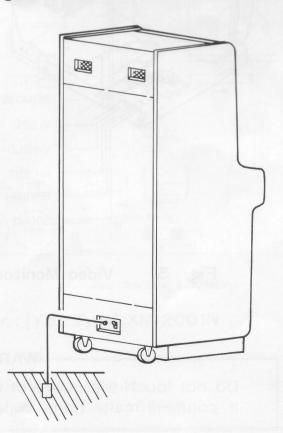
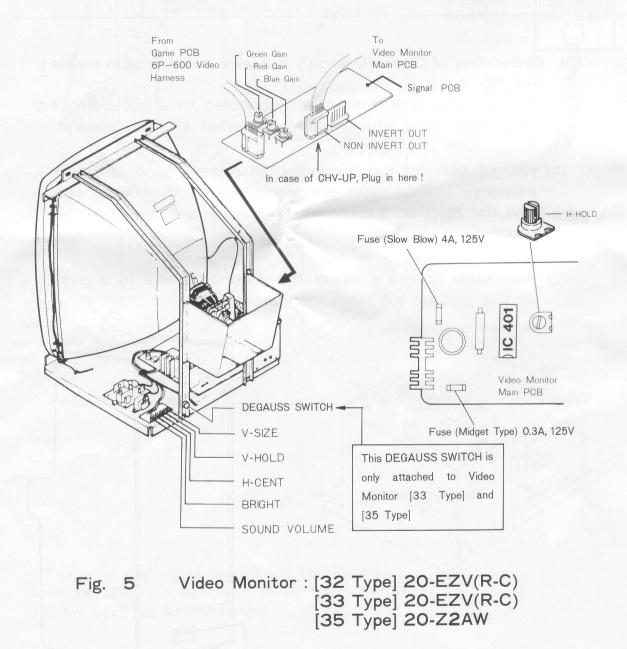


Fig. 4 Grounding of Game

(4) Adjustment of Video Monitor

This game uses one of four types of Video Monitors which are different in appearance but identical in function. The four types can be interchanged.

(a) Video Monitor : [32 Type] 20-EZV(R-C)(b) Video Monitor : [33 Type] 20-EZV(R-C)(c) Video Monitor : [35 Type] 20-Z2AW



-WARNING -

Do not touch the inside of the Video Monitor.

It contains many parts supplied with high voltage.

(d) Video Monitor: [Y51 Type] XM-2001N

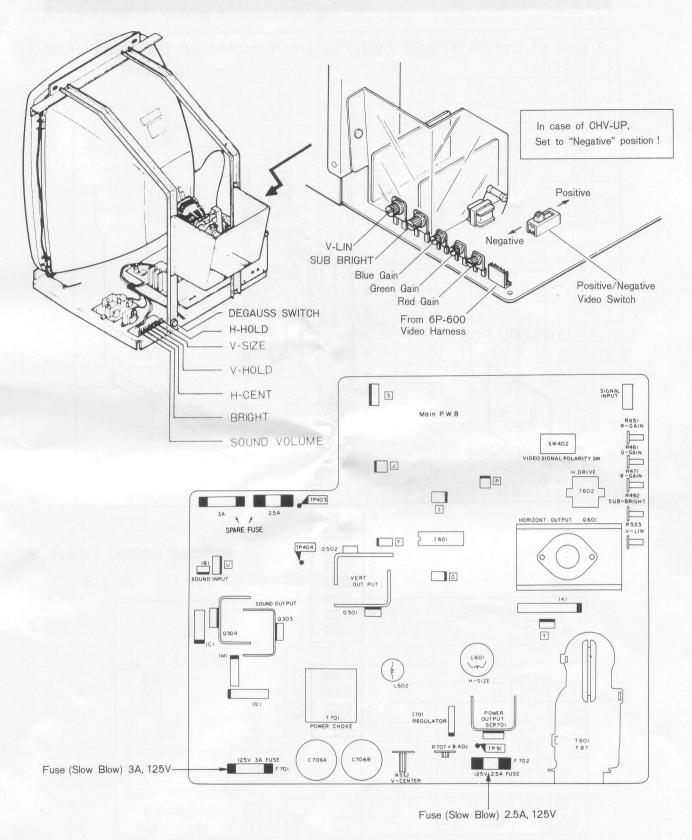


Fig. 6 Video Monitor: [Y51 Type] XM-2001N

-WARNING-

Do not touch the inside of the Video Monitor. It contains many parts supplied with high voltage.

2. Option Switch Settings

A pair of Option Toggle Switches are mounted on the Game PCB.

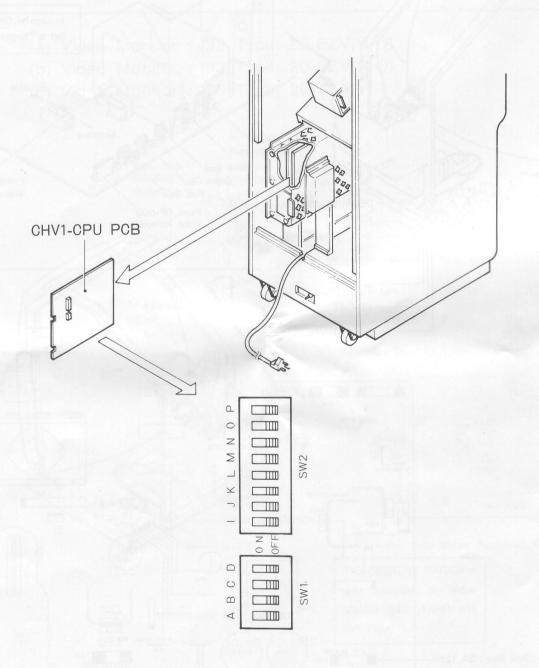


Fig. 7 Option Toggle Switches

A. Game Price Settings

Fig. 8 Game Price Settings

		To	ggle Settir	ngs		
Play/coin		SW1				
m nalocalional	A	В	С	D	N	
1/6	OFF	OFF	OFF	ON	OFF	
2/5	OFF	ON	OFF	OFF	ON	
1/5	OFF	OFF	ON	OFF	OFF	
5/4	ON	OFF	OFF	OFF	ON	
3/4	ON	OFF	ON	ON	ON	
1/4	ON	ON	OFF	OFF	OFF	
5/3	OFF	OFF	OFF	OFF	ON	
4/3	OFF	ON	ON	ON	OFF	
2/3	ON	OFF	OFF	ON	OFF	
1/3	OFF	OFF	ON	ON	OFF	
5/2	ON	OFF	ON	ON	OFF	
3/2	ON	ON	OFF	ON	OFF	
1/2	ON	OFF	OFF	OFF	OFF	
1/1	OFF	OFF	OFF	OFF	OFF	
2/1	OFF	ON	OFF	OFF	OFF	
3/1	ON	OFF	ON	OFF	OFF	
4/1	OFF	ON	ON	OFF	OFF	
5/1	OFF	ON	OFF	ON	OFF	
6/1	ON	ON	ON	OFF	OFF	
Freeplay	ON	ON	ON	ON	OFF	

B. Game Option Settings

Fig. 9 Game Option Settings

		Toggle (SW2) Settings						
- Passag	201	J	K	L	М	8047	0	Р
Game Difficulty	NQ.	718-						
Easy (0)	OFF	OFF						
(1)	ON	OFF						
(2)	OFF	ON						
Hard (3)	ON	ON						
3 Rematches Allowe	ed	eagle !	Billion			Potes	OFF	
7 Rematches Allowe							ON	
Self-Test/Game								1
Game (0)								OFF
Self-Test (1)								ON

— WARNING —

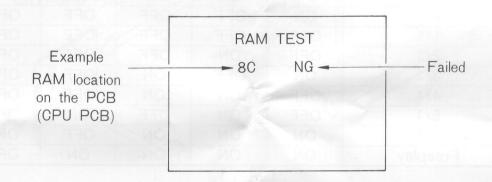
All the Option Switch Settings MUST be done with Power Off.

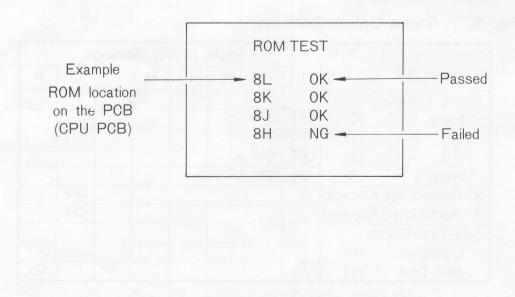
3. Self-Test and Bookkeeping

(1) Entry

There are two ways to enter Self-Test and Bookkeeping modes.

- (a) While pressing the Service Switch, set the Power On/Off. Switch to the "On" position. The hall of fame RAM is now possible to reset.
- (b) Set for Self-Test Mode with Toggle P (SW2) on the Game PCB. And set the Power On/Off Switch to the "On" position.
- (2) Self-Test and Bookkeeping are self-explanatory on the Video Monitor as follows.





4. Maintenance and Repair

A. Fuse Replacement

This game contains 4 fuses. Replace fuses only with the same type as listed below.

Fig IO Specification of Fuses

(1) Main Fuse	Europe : 3A	A 125V (90~120V) A 250V (200~240V) Bee Fig. 1 and 3
(2) Power Supply F	use	3A 125V(Midget) See Fig. 3
(3) Video Monitor F (a) [32 Type] 20 (b) [33 Type] 20 (c) [35 Type] 20 (d) [Y51 Type] >)-EZV(R-C))-EZV(R-C))-Z2AW	4A 125V(Slow Blow) 0.3A 125V(Midget) See Fig. 5 2.5A 125V(Slow Blow) 3A 125V(Slow Blow) See Fig. 6

B. Cleaning

The exterior of the game, all metal parts and all plastic parts can be cleaned with a nonabrasive cleanser. You should be careful when cleaning the glass or plastic parts. A dry cloth may cause scratches which will result in a foggy appearance.

C. Operation Panel

(1) Operation Panel Removal

Before repairing or replacing any switches or Complete A2PL Controller Ass'y. on the Operation Panel, unplug the game. Open the Service Door, which are reach through the opening, and unlock the Clamps, located at each end on the underside of the Operation Panel. See Fig. 13.

(2) Micro-switch Replacement

Whenever you replace any micro-switch on the Operation Panel, a switch gap adjustment is needed as shown in Fig. 11. Also, see Fig. 19. for layout of Control Panel Switches.

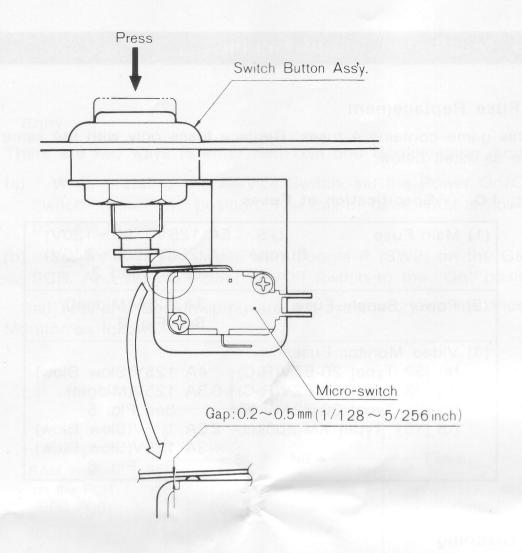


Fig. II Switch gap adjustment

(3) Lubrication for Complete A2PL Controller Ass'y.

To maintain the Complete A2PL Controller Ass'y, in good condition, lubricate the pillow balls and 2 way Guide Plate approx, every 3 months. See Fig. 12.

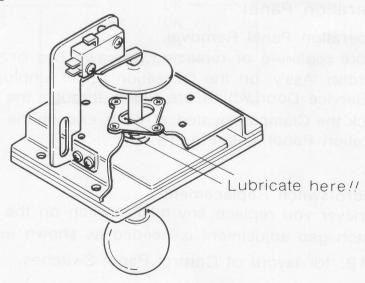


Fig. 12 Lubrication points

D. Video Monitor Removal

(1) Front Screen Removal

First remove the Operation Panel and then pull the Front Screen toward you.

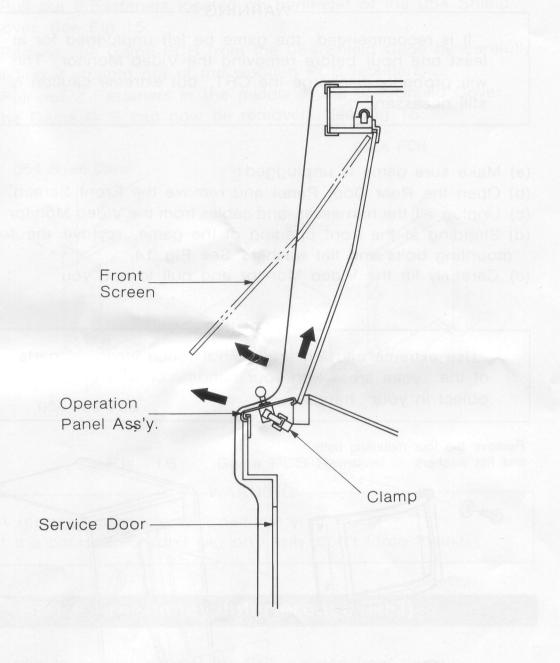


Fig. 13 Front Screen and
Operation Panel Ass'y. Removal

(2) Video Monitor Removal

If you need to remove the Video Monitor, follow the instructions listed below. But the following procedure should only be performed by an experienced service technician.

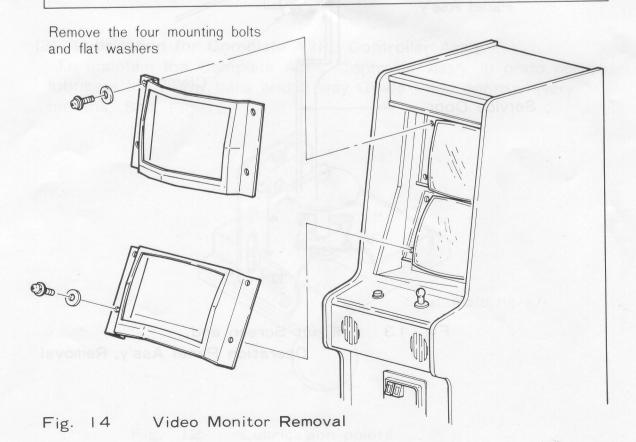
-WARNING -

It is recommended the game be left unplugged for at least one hour before removing the Video Monitor. This will probably discharge the CRT, but extreme caution is still necessary.

- (a) Make sure game is unplugged!!
- (b) Open the Rear Door Panel and remove the Front Screen.
- (c) Unplug all the harnesses and cables from the Video Monitor.
- (d) Standing at the front opening of the game, remove the four mounting bolts and flat washers. See Fig. 14.
- (e) Carefully lift the Video Monitor and pull toward you.

-WARNING-

Use extreme caution and do not touch electrical parts of the yoke area with your hands or with any metal object in your hands.



E. Game PCB Removal

- (a) Make sure the game is unplugged!!
- (b) Open the Rear Door Panel.
- (c) Remove the 56-pin edge connector from the right side of the 054-FCC PCB on the 054 Shield Cover.
- (d) Pull out 6 Fasteners located on perimeter of the 054 Shield Cover. See Fig. 15.
- (e) Remove the Game PCB from the 054 Shield Cage by carefully sliding it straight out of the wooden PCB retainers.
- (f) Pull out 2 Fasteners in the middle of the 054 Shield Cover. The Game PCB can now be removed. See Fig. 15.

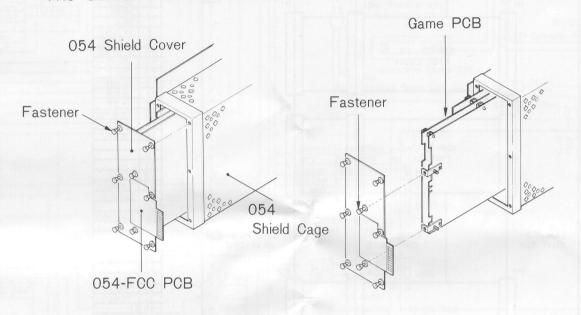


Fig. 15 Game PCB Removal

WARNING -

A reversed connector will damage your PCB!

If the connectors don't slip on easily, don't force them!

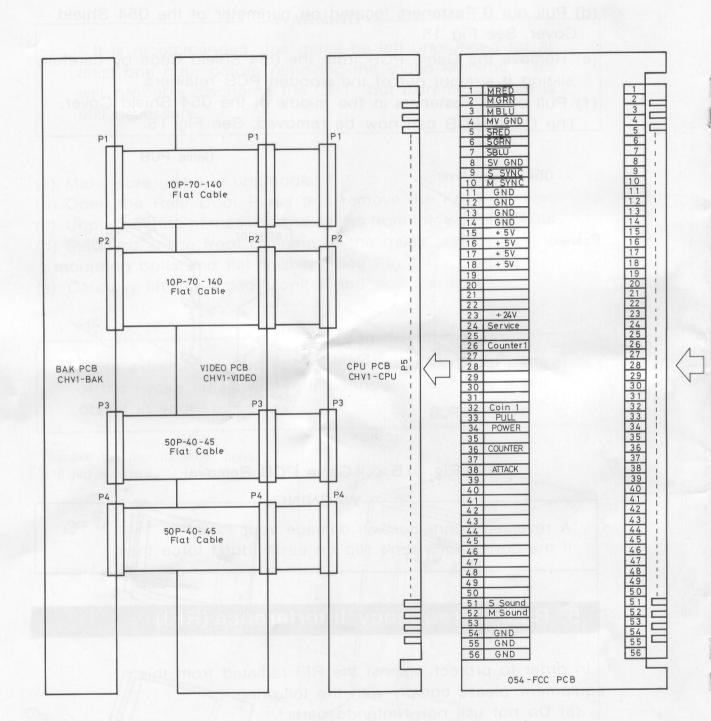
5. Radio Frequency Interference (RFI)

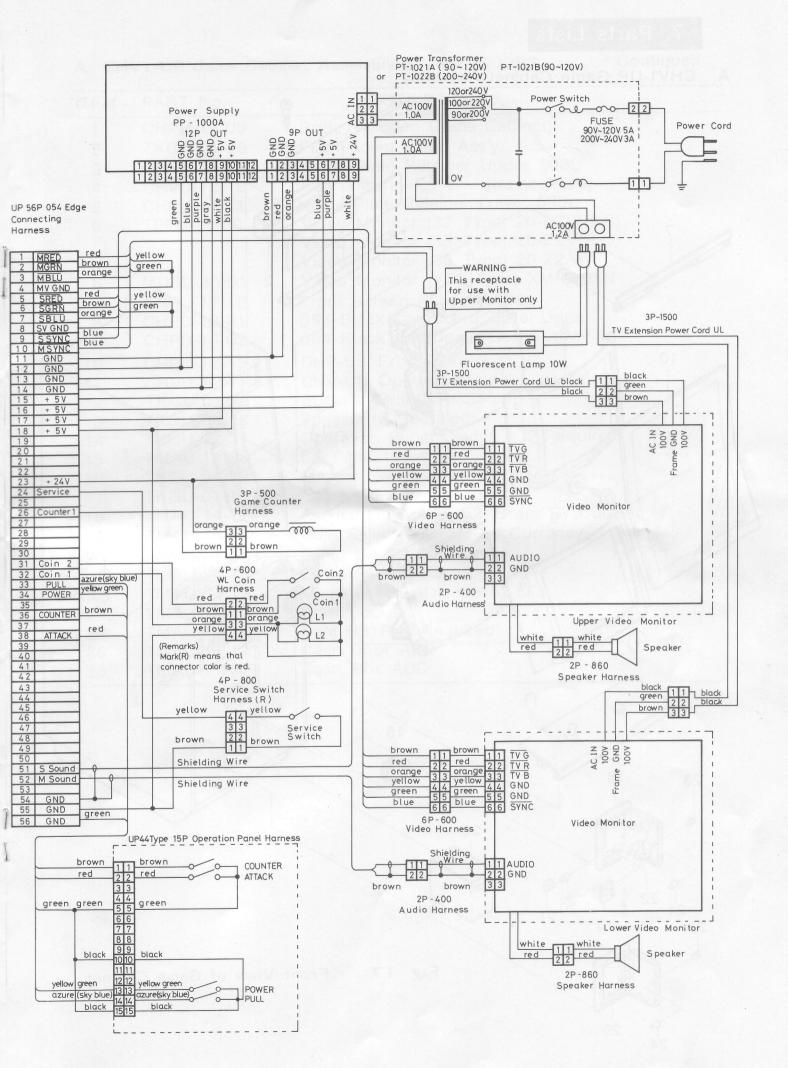
In order to protect against the RFI radiated from this equipment, please comply with the following.

- (a) Do not use non-Nintendo parts!
- (b) Do not modify your game circuitry!
- (c) Do not modify the wiring harness and connections!
- (d) Connect this game only to a grounded 3-wire outlet.
- (e) After servicing the Game PCB, shut the 054 Shield Cover completely with the Fasteners. See Fig. 15.

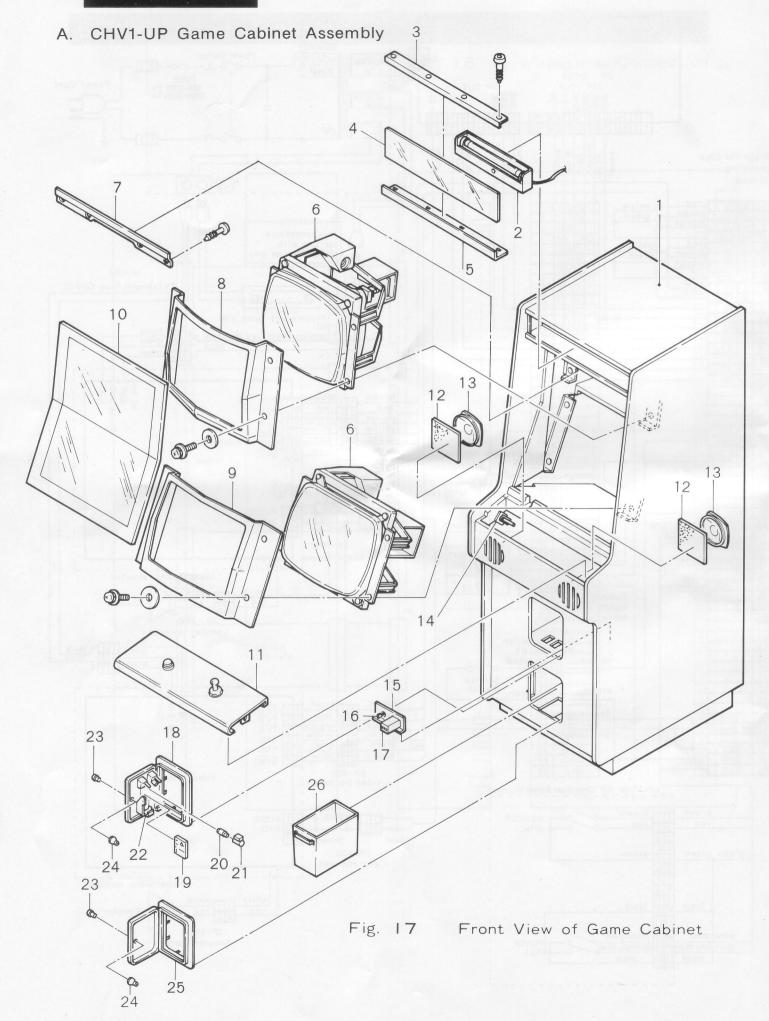
6. Wiring and Connection

Fig. 16 Wiring and Connection





7. Parts Lists



ITEM	PART No.	DESCRIPTION
1	CHPU-13-03	Body (Wooden Game Cabinet)
2	TKGU-01-29	Fluorescent Lamp Ass'y.
3	CHPU-11-19	Name Plate Retainer Upper 598L
4	CHVU-12-12	CHV Display Panel (Name Plate)
5	CHPU-11-11	Name Plate Retainer Lower 598L
6	TPPU-20-00	Video Monitor [32 Type] 20-EZV(R-C)
		Video Monitor [33 Type] 20-EZV(R-C)
		Video Monitor [35 Type] 20-Z2AW
6	MDSU-33-01	Video Monitor [Y51 Type] XM-2001N
7	CHPU-11-10	Front Screen Retainer 598L
8	CHPU-13-01	054 Black Cardboard Bezel Upper
9	CHPU-13-02	054 Black Cardboard Bezel Lower
10	CHPU-12-13	CHP-US Front Screen
11	CHVU-12-11	CHV-US Operation Panel (Panel Only)
12	TKGU-01-49	Speaker Grill (2 Required)
13	TKGU-01-43	Speaker (2 Required)
14	TKGU-01-31	Operation Panel Clamp A (2 Required)
15	TMAU-11-20	CS Plate 120W
16	TKGU-01-33	Service Switch (with Button)
17	TKGU-01-11	Game Counter
18	TMAU-14-17	Service Door ADD-S2: Order By Currency
19	TMAU-14-18	Coin Selector: Order By Currency
20	TMAU-34-17	Lamp BA-9S 6.3V 0.15A
21	TMAU-34-16	Lamp Socket BA-9S
22	TMAU-34-19	Micro-switch ADD D2MC-5F1
23	TMAU-14-12	Door Lock
24	TMAU-11-14	Cam B31R (2 Required)
25	TMAU-14-11	Cash Door ADD
26	TMAU-11-27	Cash Box ADD

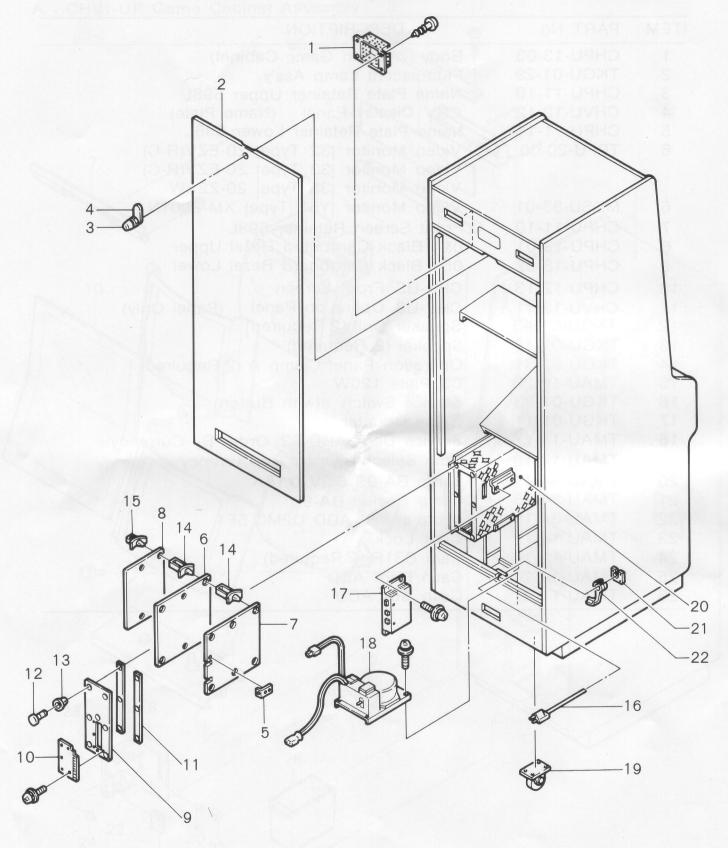


Fig. 18 Rear View of Game Cabinet

A. CHV1-UP Game Cabinet Assembly: PARTS LIST

ITEM	PART No.	DESCRIPTION
1	TKGU-01-61	Vent Grill (2 Required)
2	CHPU-13-15	Rear Door Panel
3	TMAU-14-14	Lock K6510
4	TMAU-11-15	Cam A
5	CHPU-11-18	PCB Stopper (2 Required)
6	CHVU-22-01	CHV1-VIDEO Complete PCB Assembly
7	CHVU-21-01	CHV1-CPU Complete PCB Assembly
8	CHVU-24-01	CHV1-BAK Complete PCB Assembly
9	CHPU-01-01-11	054 Shield Cover
10	CHPU-23-01	054-FCC Complete PCB Assembly
11	CHPU-11-17	054 Shield Spacer (2 Required)
12	CHPU-23-35	Nylatch Fastener (8 Required)
13	CHPU-23-34	Nylatch Grommet (8 Required)
14	CHPU-01-19	PCB Support CBSS-12N (9 Required)
15	CHPU-01-20	PCB Support CBSS-8N (5 Required)
16	TKGU-01-08	Power Cord: Order By Voltage & Plug Type
17	CHPU-88-01	PP-1000A Complete Power Supply Assembly
18	CHPU-08-01	PT-1021A Power Transformer (For 90~120V)
18	CHPU-18-01	PT-1021B Power Transformer (For 90~120V)
18	CHPU-18-02	PT-1022B Power Transformer (For 200~240V)
19	TKGU-01-30	Caster (2 Required)
20	CHPU-01-01-10	054 Shield Cage
21	TKGU-01-65	Strain Relief Bushing Plate
22	TKGU-01-10	Strain Relief Bushing

B. CHV1-UP Operation Panel Assembly

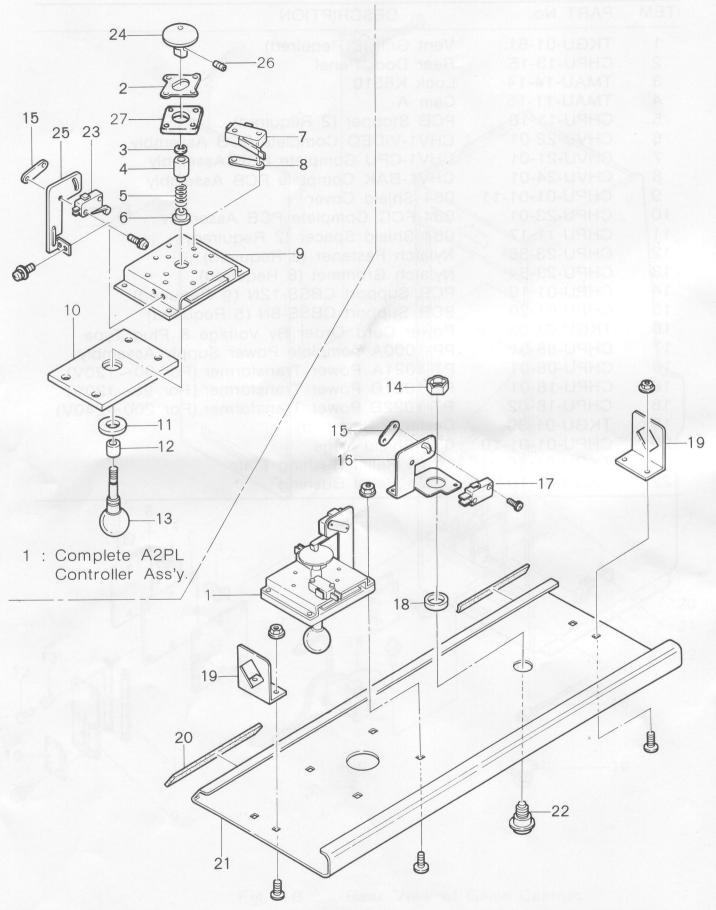


Fig. 19 Operation Panel Assembly

B. CHV1-UP Operation Panel Assembly: PARTS LIST

ITEM	PART No.	DESCRIPTION
1	CHVU-14-11	Complete A2PL Controller Ass'y.
2	TMAU-11-17	2 way Guide Plate
3	TKGU-23-23	E Ring 4
4	CHSU-11-12	A5 Switch Collar
5	TKGU-23-22	Lever Spring
6	TKGU-23-20	Spring Stopper
7	TKGU-23-13	Micro-switch VL12L (Bent) (2 Required)
8	TKGU-23-17	Switch Spacer (8 Required)
9	CHSU-11-11	A5 Bearing Bracket
10	TMAU-12-15	Lever Plate
11	TMAU-12-14	Control Knob Plate 28D
12	CHVU-12-13	Controller Knob Collar 23L
13	CHVU-11-11	A5 Knob with Shaft 101.5L
14	TKGU-23-34	Pal Nut
15	TKGU-23-26	Nut Plate (2 Required)
16	TKGU-23-12	Switch Button Bracket
17	TMAU-34-18	Micro-switch VL12L (Straight)
18	TMAU-12-18	Collar $34 \times 28 \times 7H$
19	TMAU-11-19	Operation Panel Fastener B 38W (2 Required)
20	CHPU-12-17	Black Sponge $2\times10\times590L$
21	CHVU-12-11	CHV-US Operation Panel
22	TKGU-23-32	Orange Button Ass'y.
23	TKGU-23-10	Micro-switch VL105L2
24	CHSU-11-15	Pull switch Button
25	CHSU-11-14	Pull switch Button Bracket
26	CHSU-51-11	Hexagon Socket Headless Set Screw
27	CHVU-12-14	Rubber Guide Plate

C. CHV1-UP Wiring Harnesses

PART No.	DESCRIPTION	See Fig. 16
CHPU-41-16	UP 56P 054 Edge C	Connecting Harness
TPPU-93-02	9	ess (400mm) (2 Required)
TPPU-93-07		ess (600mm) (2 Required)
TMAU-41-12	3P-500 Game Coun	
CHPU-41-13	4P-800 Service Swit	ch Harness (800 mm)
TMAU-41-14	4P-600 WL Coin Ha	arness (600mm)
TKGU-13-17	2P Speaker Harness	[2P-860] (860mm) (2 Required)
CHPU-41-11	UP 44 Type 15P Op	eration Panel Harness
CHPU-93-12	50P-40-45 Flat Cabl	
CHPU-93-11	10P-70-140 Flat Cal	ble (2 Required)
CHVU-41-11	3P-1500 TV Extensi	ion Power Cord UL(2 Required)

D. CHV1-CPU PCB Assembly (For O1 and O2 versions) : PARTS LIST

PART No.	DESCRIPTION (Reference Designations ar	nd Locations)
CHVU-21-01	CHV1-CPU Complete PCB Assembly	
CHVU-21-01	Crivi-Or o Complete 1 OB Assembly	
CHVU-21-11	Z80A Microprocessor	(6H)
CHVU-21-12	VLM5030 Speech Synthesizer	(6M)
CHVU-21-13	RP2A03 Microprocessor	(4H)
CHVU-21-15	2764 8K-Byte EP-ROM 250ns CHV1-C-4	K (4K)
CHVU-21-16	2764 8K-Byte EP-ROM 300ns CHV1-C-8	
CHVU-21-17	2764 8K-Byte EP-ROM 300ns CHV1-C-8	J (8J)
CHVU-21-18	2764 8K-Byte EP-ROM 300ns CHV1-C-8	
CHVU-21-19	2764 8K-Byte EP-ROM 300ns CHV1-C-8	
CHVU-21-20	27128 16K-Byte EP-ROM 300ns CHV1-C-	
CHVU-21-21 CHVU-21-22	27128 16K-Byte EP-ROM 300ns CHV1-C HM6116AP-15 2K-Byte RAM 150ns	(4L)
CHVU-21-23	TC5533P-A 4K-Byte RAM 150ns	(8D)
CHVU-21-24	HM6264P-15 8K-Byte RAM 150ns	(8C)
CHVU-21-25	TC5514AP-3 1Kx4-Bit C-MOS RAM 300r	ns (8M)
CHVU-21-26	74LS00 Quad 2-Input NAND	(3B)
CHVU-21-27	74LS02 Quad 2-Input NOR	(3A)
CHVU-21-28		4B, 3C, 6D, 6E)
CHVU-21-29	74LS08 Quad 2-Input AND	(5D)
CHVU-21-30	74LS14 Hex Schmitt Inverters	(1C)
CHVU-21-31	74LS74A Dual "D" Flip-Flops (P, CL)	(1D, 1F) (5L)
CHVU-21-32 CHVU-21-33	74LS92 Divide-By-Twelve Counter 74LS109A Dual J-K Flip-Flops (PLE, CL)	
CHVU-21-34	있는 사람들은 ''에서 가는 사람들이 있는데 가장 보고 있는데 있다면 하면 되었다. 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은	(2C, 2D, 7D)
CHVU-21-35	74LS139 Dual 2 To 4 Decoders	(7E, 8A)
CHVU-21-36		5A, 5B, 6B, 7B)
CHVU-21-37		(4A)
CHVU-21-38 CHVU-21-39	74LS240 Octal Bus Inverters (TS) (1 74LS245 Octal Bus Transceivers (TS)	(7F) (7F)
CHVU-21-40	74LS259 8-Bit Addressable Latches	(2B)
CHVU-21-41	74LS365 Hex Bus Drivers	(5C, 6C, 7C)
CHVU-21-42	74LS367 Hex Bus Drivers	(6F, 6K, 7K)
CHVU-21-43		6A, 7A, 2H, 2J, 6L)
CHVU-21-44	74S04 Hex Inverters	(5K) (5H)
CHVU-21-45 CHVU-21-46	7437 Quad 2-Input NAND Buffers 75471 Dual Peripheral AND Drivers	(35)
CHVU-21-40	74HC20 Dual 4-Input NAND	(8N)
CHVU-21-48	PST518A Low Voltage Detector	(3L)
CHVU-21-49	LM324 Quad Operational Amplifiers	(2N)
CHVU-21-50	2SC1815 Silicon NPN Transistor	(Q1~Q3)
CHVU-21-50 CHVU-21-108	2SC2235 Silicon NPN Transistor	(Q4)
(behupe)	3P-1500 TV Extension Power Ecord UL(2.1	TRETA-UVH
CHVU-21-51	ES1F Diode	(D1)
CHVU-21-52	1S5277B Diode	(D2, D3) (D4~D6)
CHVU-21-53	1S2076 Diode	(07 00)

PART No.	DESCRIPTION (Reference Designations and Locations)
CHVU-21-54	DAN401 Quad Cathode-Common Diode Array (DA1, DA2, DA3, DA4)
CHVU-21-55 CHVU-21-56 CHVU-21-57 CHVU-21-109 CHVU-21-120 CHVU-21-58 CHVU-21-59 CHVU-21-61 CHVU-21-61 CHVU-21-65 CHVU-21-65 CHVU-21-65 CHVU-21-66 CHVU-21-67 CHVU-21-67	330 pf 50V±5% Styrol Capacitor 0.01 uf 50V±10% Mylar Capacitor 0.015 uf 50V±10% Mylar Capacitor 68 pf 50V Ceramic-Disc Capacitor 100pf 50V Ceramic-Disc Capacitor 180 pf 50V Cer
CHVU-21-69	0 Ohm Shunt Lead (R18, R19)
CHVU-21-70 CHVU-21-71 CHVU-21-72 CHVU-21-73 CHVU-21-74 CHVU-21-75 CHVU-21-76 CHVU-21-77 CHVU-21-79 CHVU-21-80 CHVU-21-81 CHVU-21-82 CHVU-21-85 CHVU-21-85 CHVU-21-86 CHVU-21-87 CHVU-21-88 CHVU-21-89 CHVU-21-90 CHVU-21-91 CHVU-21-92 CHVU-21-93 CHVU-21-94	10 Ohm 1/4W±5% Resistor 51 Ohm 1/4W±5% Resistor 100 Ohm 1/4W±5% Resistor 110 Ohm 1/4W±5% Resisto
CHVU-21-95 CHVU-21-96	8 MHz Crystal (X1) 21.47727 MHz Crystal (X2)

PART No.	DESCRIPTION(Reference Designations	and Locations)
CHVU-21-97	4-Station, Single-Throw, DIP Bit Switch	(SW1)
CHVU-21-98	8-Station, Single-Throw, DIP Bit Switch	
CHVU-21-111	24 Pin DIP IC Socket	(S13)
CHVU-21-99	28 Pin DIP IC Socket	(S4~S10)
CHVU-21-100	40 Pin DIP IC Socket	(S1~S3)
CHVU-21-101	10 Pin Connector Receptacle	(P1, P2)
CHVU-21-102	50 Pin Flat Cable Header	(P3, P4)
CHVU-21-103	Battery Case TYPE33-3 (UM-3x3)	
CHVU-21-104	Flat Head Screw M2.6x8	
CHVU-21-105	Nut Plate M2.6-P30	(2 per assembly)
CHVU-21-106	Wire Tie T18L	
CHVU-21-107	Dry Battery UM-3 ("AA" Dry Cell)	(3 per assembly)

There are different versions of the VIDEO P.C. Board.

CHV1-01-VIDEO: 01 version CHV1-02-VIDEO: 02 version

When ordering parts, please give the part number and part name of each version parts list.

E. CHV1-VIDEO PCB Assembly (For O1 version): PARTS LIST Continued

PART No.	DESCRIPTION (Reference Designations and Loca	ations)
CHVU-22-01	CHV1-VIDEO Complete PCB Assembly	
CHVU-22-15 CHVU-22-16 CHVU-22-17 CHVU-22-18 CHVU-22-19 CHVU-22-20 CHVU-22-21 CHVU-22-22 CHVU-22-23 CHVU-22-25 CHVU-22-25 CHVU-22-26 CHVU-22-27 CHVU-22-27 CHVU-22-28 CHVU-22-29 CHVU-22-30 CHVU-22-31	2764 8K-Byte EP-ROM 450ns CHV1-V-6N 2764 8K-Byte EP-ROM 450ns CHV1-V-8N 2764 8K-Byte EP-ROM 450ns CHV1-V-6P 2764 8K-Byte EP-ROM 450ns CHV1-V-8P 27128 16K-Byte EP-ROM 300ns CHV1-V-2R 27128 16K-Byte EP-ROM 300ns CHV1-V-3R 27128 16K-Byte EP-ROM 300ns CHV1-V-4R 27128 16K-Byte EP-ROM 300ns CHV1-V-2T 27128 16K-Byte EP-ROM 300ns CHV1-V-3T 27128 16K-Byte EP-ROM 300ns CHV1-V-4T 27128 16K-Byte EP-ROM 300ns CHV1-V-4U 27128 16K-Byte EP-ROM 300ns CHV1-V-3U 27128 16K-Byte EP-ROM 300ns CHV1-V-3U 27128 16K-Byte EP-ROM 300ns CHV1-V-4U 27128 16K-Byte EP-ROM 300ns CHV1-V-4U 27128 16K-Byte EP-ROM 300ns CHV1-V-2V 27128 16K-Byte EP-ROM 300ns CHV1-V-2V	(6N) (8N) (6P) (8P) (2R) (3R) (4R) (2T) (3T) (4T) (2U) (3U) (4U) (2V) (3V) (2D) (8H, 2N)

PART No.	DESCRIPTION (Reference Designations and Locations)
CHVU-21-26 CHVU-21-28 CHVU-22-32 CHVU-22-33 CHVU-22-34 CHVU-22-35 CHVU-21-31 CHVU-21-34 CHVU-21-35 CHVU-21-35 CHVU-22-37 CHVU-22-38 CHVU-22-39 CHVU-22-40	74LS00 Quad 2-Input NAND 74LS04 Hex Inverters (6C, 4D, 4E, 6E, 1J, 6T) 74LS10 Triple 3-Input NAND (6U) 74LS11 Triple 3-Input AND (8D, 6V) 74LS20 Dual 4-Input NAND (7V) 74LS21 Dual 4-Input AND (1K) 74LS74A Dual "D" Flip-Flops (P, CL) (3D, 6R, 7S, 7T, 7U) 74LS86 Quad 2-Input Exclusive OR (7D, 1H, 5P, 1S) 74LS138 3 To 8 Decoder (5B, 5E, 1R) 74LS139 Dual 2 To 4 Decoders (5F, 6J) 74LS151 8 To 1 Data Selectors 74LS153 Dual 4 To 1 Data Selectors 74LS157 Quad 2 To 1 Data Selectors (7R)
CHVU-21-36 CHVU-22-41 CHVU-22-42 CHVU-22-43 CHVU-22-45 CHVU-22-46 CHVU-22-47 CHVU-21-42 CHVU-21-43 CHVU-21-43 CHVU-22-50 CHVU-22-50 CHVU-22-50 CHVU-22-51 CHVU-22-52 CHVU-22-53 CHVU-22-54 CHVU-22-55	74LS161A 4-Bit Binary Counters (2A, 7C, 8C, 6D, 2E 3E, 7E, 8E, 6F, 3M, 4M, 5M, 8T, 8U) 74LS164 8-Bit Shift Registers (5J, 5K, 2L,2M) 74LS174 Hex "D" Flip-Flops (3L, 4L) 74LS175 Quad "D" Flip-Flops (CL) (2C) 74LS244 Octal Buffers & Line Drivers (TS) (3N, 3P, 5H) 74LS273 Octal "D" Flip-Flops (CL) (7H, 8J, 1N, 1P, 2P) 74LS283 4-Bit Full Adder (2K, 3K, 4K) 74LS299 8-Bit Shift/Storage Registers (8R, 8S) 74LS367 Hex Bus Drivers (2B, 5W) 74LS373 Octal "D" Transparent Latches(3A, 3B, 7B, 8B, 3C) 74LS374 Octal "D" Flip-Flops (8V) 74LS375 4-Bit Bistable Latches (4A, 5A, 4B, 6B, 4C) 74LS377 Octal "D" Flip-Flops (7J, 1T, 1V, 4V) 74S04 Hex Inverters (1B) 74F04 Hex Inverters (1C) 74F74 Dual "D" Flip-Flops (P, CL) (1D, 4H) 74F161 4-Bit Binary Counters (2H, 3H, 3H, 3H, 3H, 3H, 3H, 3H, 3H, 3H, 3
CHVU-21-51	ES1F Diode (D1)
CHVU-21-120 CHVU-21-58 CHVU-21-60 CHVU-21-62 CHVU-21-68	100 pf 50V Ceramic-Disc Capacitor (C10,C11,C12,C13,C141) 180 pf 50V Ceramic-Disc Capacitor (C1) 330 pf 50V Ceramic-Disc Capacitor (C2,C3,C4,C15,C17,C140) 0.01 uf 50V Ceramic-Disc Capacitor (C20~C138) 220 uf 16V AI Electrolytic Axial Cap. (C5)

PART No.	DESCRIPTION (Reference Designation	ns and Locations)
CHVU-21-75 CHVU-21-77 CHVU-21-79 CHVU-21-93	330 Ohm 1/4W ±5% Resistor 1K Ohm 1/4W ±5% Resistor 3.3K Ohm 1/4W ±5% Resistor Octal 1K Ohm Series Resistor Array	(R1, R2) (R20~R31) (R3, R4) (RM1)
CHVU-22-57 CHVU-22-58 CHVU-21-99 CHVU-21-101 CHVU-21-102	20.160MHz Crystal 16 Pin DIP IC Socket 28 Pin DIP IC Socket 10 Pin Connector Receptacle 50 Pin Flat Cable Header	(X1) (S21) (S1~S11, S13~S20) (P1, P2) (P3, P4)

F. CHV1-VIDEO PCB Assembly (For O2 version): PARTS LIST Continued

PART No.	DESCRIPTION (Reference Designations and Locations)	
CHVU-22-01	CHV1-VIDEO Complete PCB Assembly	
CHVU-22-59	2564 8K-Byte EP-ROM 450ns CHV1-V-6N (6	SN)
CHVU-22-60	2564 8K-Byte EP-ROM 450ns CHV1-V-8N (8	3N)
CHVU-22-61		SP)
CHVU-22-62		3P)
CHVU-22-19		2R)
CHVU-22-20		3R)
CHVU-22-21		1R)
CHVU-22-22		2T)
CHVU-22-23		3T)
CHVU-22-24	그 사람들이 얼마나 아니는	4T)
CHVU-22-25		2U)
CHVU-22-26		BU)
CHVU-22-27		1U)
CHVU-22-28		2V)
CHVU-22-29		3V)
CHVU-22-30		2D)
CHVU-22-31	HM6116ASP-15 2K-Byte RAM 150ns (8H, 2	
01110 == 01	Person of the residence of the second	
CHVU-21-26	74LS00 Quad 2-Input NAND (1E, 6S, 5	5L)
CHVU-21-28	74LS04 Hex Inverters (6C, 4D, 4E, 6E, 1J, 6	
CHVU-22-32		SU)
CHVU-22-33	74LS11 Triple 3-Input AND (8D, 6	
CHVU-22-34		7V)
CHVU-22-35		IK)
CHVU-21-31	74LS74A Dual "D" Flip-Flops (P, CL) (3D, 6R, 7S, 7T, 7	,
01.10 2. 01		

PART No.	DESCRIPTION (Reference Designations and Locations)
CHVU-22-36	74LS86 Quad 2-Input Exclusive OR (7D, 1H, 5P, 1S)
CHVU-21-34	74LS138 3 To 8 Decoder (5B, 5E, 1R)
CHVU-21-35	74LS139 Dual 2 To 4 Decoders (5F, 6J) 74LS151 8 To 1 Data Selector (1U, 1W, 4W)
CHVU-22-37	712010101010
CHVU-22-38	74LS153 Dual 4 To 1 Data Selectors (5C, 5D)
CHVU-22-39	74LS157 Quad 2 To 1 Data Selectors (4P, 7F, 8F, 6H, 4N, 5N, 7R)
CHVU-21-36	74LS161A 4-Bit Binary Counters (2A, 7C, 8C, 6D, 2E, 3E, 7E, 8E, 6F, 3M, 4M, 5M, 8T, 8U)
CHVU-22-41	74LS164 8-Bit Shift Registers (5J, 5K, 2L,2M)
CHVU-22-42	74LS174 Hex "D" Flip-Flops (3L, 4L)
CHVU-22-43	74LS175 Quad "D" Flip-Flops (CL) (2C)
CHVU-22-44	74LS244 Octal Buffers & Line Drivers (TS) (3N, 3P, 5H)
CHVU-22-45	74LS273 Octal "D" Flip-Flops (CL) (7H, 8J, 1N, 1P, 2P)
CHVU-22-46	(OV OV AK)
CHVU-22-47	74LS299 8-Bit Shift/Storage Registers (8R, 8S)
CHVU-21-42	74LS283 4-Bit Full Adder 74LS299 8-Bit Shift/Storage Registers 74LS367 Hex Bus Drivers (2R, 3R, 4R) (2R, 8S) (2R, 8S)
CHVU-22-48	74LS373 Octal "D" Transparent Latches(3A, 3B, 7B, 8B, 3C)
CHVU-21-43	74LS374 Octal "D" Flip-Flops (8V)
CHVU-22-49	74LS375 4-Bit Bistable Latches (4A, 5A, 4B, 6B, 4C)
CHVU-22-50	74LS377 Octal "D" Flip-Flops (7J, 1T, 1V, 4V)
CHVU-21-44	74S04 Hex Inverters (1B)
CHVU-22-51	74F04 Hex Inverters (1C)
CHVU-22-52	74F74 Dual "D" Flip-Flops (P, CL) (1D, 4H)
CHVU-22-53	74F161 4-Bit Binary Counters (1F, 2F, 3F, 4F)
CHVU-22-54	74F174 Hex "D" Flip-Flops (2H, 3H)
CHVU-22-55	74F283 4-Bit Full Adder (2J, 3J, 4J)
CHVU-21-51	ES1F Diode (D1)
CHVU-21-120	100 pf 50V Ceramic-Disc Capacitor (C10,C11,C12,C13,C141)
CHVU-21-58	180 pf 50V Ceramic-Disc Capacitor (C1)
CHVU-21-60	330 pf 50V Ceramic-Disc Capacitor (C2,C3,C4,C15,C17,C140)
CHVU-21-62	0.01 uf 50V Ceramic-Disc Capacitor (C20~C138)
CHVU-21-68	220 uf 16V Al Electrolytic Axial Cap. (C5)
CHVU-21-75	330 Ohm $1/4W \pm 5\%$ Resistor (R1, R2)
CHVU-21-77	1K Ohm 1/4W \pm 5% Resistor (R20 \sim R31)
CHVU-21-79	3.3K Ohm $1/4W \pm 5\%$ Resistor (R3, R4)
CHVU-21-93	Octal 1K Ohm Series Resistor Array (RM1)
CHVU-22-57	20.160MHz Crystal (X1)
CHVU-22-58	16 Pin DIP IC Socket (S21)
CHVU-21-99	28 Pin DIP IC Socket (S1 \sim S11, S13 \sim S20)
CHVU-21-101	10 Pin Connector Receptacle (P1, P2)
CHVU-21-102	50 Pin Flat Cable Header (P3, P4)

G. CHV1-BAK PCB Assembly: PARTS LIST Continued

PART No.	DESCRIPTION (Reference Designation and Locations)
CHVU-24-01	CHV1-BAK Complete PCB Assembly
CHVU-24-11 CHVU-24-12 CHVU-24-13 CHVU-24-14 CHVU-24-15 CHVU-24-16 CHVU-24-17 CHVU-24-18 CHVU-24-19 CHVU-24-20 CHVU-24-21 CHVU-24-21 CHVU-24-21 CHVU-24-22 CHVU-22-31	2764 8K-Byte EP-ROM 300ns CHV1-B-2K 27128 16K-Byte EP-ROM 300ns CHV1-B-2D 27128 16K-Byte EP-ROM 300ns CHV1-B-2E (2E) 27128 16K-Byte EP-ROM 300ns CHV1-B-2L (2L) 27128 16K-Byte EP-ROM 300ns CHV1-B-2L (2L) 27128 16K-Byte EP-ROM 300ns CHV1-B-2M (2M) N82S131N 512x4-Bit Bipolar ROM CHV1-B-4B (4B) N82S131N 512x4-Bit Bipolar ROM CHV1-B-4C (4C) N82S131N 512x4-Bit Bipolar ROM CHV1-B-4D (4D) N82S131N 512x4-Bit Bipolar ROM CHV1-B-7B (7B) N82S131N 512x4-Bit Bipolar ROM CHV1-B-7C (7C) N82S131N 512x4-Bit Bipolar ROM CHV1-B-7D (7D) N82S129N 256x4-Bit Bipolar ROM CHV1-B-3C (3C) HM6116ASP-15 2K-Byte RAM 150ns (5F, 5H, 5L)
CHVU-21-26 CHVU-21-28 CHVU-22-38 CHVU-22-39 CHVU-21-36 CHVU-22-42 CHVU-22-44 CHVU-24-23 CHVU-24-23 CHVU-22-45 CHVU-21-42 CHVU-21-42 CHVU-21-42	74LS00 Quad 2-Input NAND 74LS04 Hex Inverters (4J, 4L, 4M) 74LS153 Dual 4 To 1 Data Selectors 74LS157 Quad 2 To 1 Data Selectors (1A,2A,2B,3B,6H,6L) 74LS161A 4-Bit Binary Counters (4F,6F,5M,6M) 74LS174 Hex "D"Flip-Flops (2H) 74LS244 Octal Buffers & Line Drivers (TS) (3H,3J,3K) 74LS257 Quad 2 To 1 Data Selectors(TS)(7F,7H,7J,7K,7L,7M) 74LS273 Octal "D" Flip-Flops (CL) (1N) 74LS299 8-Bit Shift/Storage Registers (1C,1F,1K,1L,1M,2C,2F) 74LS367 Hex Bus Drivers (4N, 5J, 6J, 5K, 6K) 74LS377 Octal "D" Flip-Flops (1D, 1E, 3D, 3E, 3F, 3L, 3M)
CHVU-21-50	2SC1815 Silicon NPN Transistor (Q1, Q3, Q5, Q7, Q8, Q10, Q12, Q14)
CHVU-24-24	2SA1015 Silicon PNP Transistor (Q2,Q4,Q6,Q9,Q11,Q13)
CHVU-21-51	ES1F Diode (D1)
CHVU-21-120 CHVU-21-59 CHVU-21-62 CHVU-21-67 CHVU-21-68	100 pf 50V Ceramic-Disc Capacitor (C6, C7) 220 pf 50V Ceramic-Disc Capacitor (C5) 0.01 uf 50V Ceramic-Disc Capacitor (C20~C97) 33 uf 16V Al Electrolytic Axial Cap. (C2~C4) 220 uf 16V Al Electrolytic Axial Cap. (C1)

PART No.	DESCRIPTION (Reference Designations and Locations)
CHVU-21-71	51 Ohm 1/4W ±5% Resistor (R4, R8, R12, R17, R44, R48, R52, R55)
CHVU-21-72	100 Ohm 1/4W ±5% Resistor (R1, R5, R9, R15, R41, R45, R49, R53)
CHVU-24-25 CHVU-21-75	240 Ohm 1/4W ±5% Resistor (R23,R28,R33,R63,R68,R73) 330 Ohm 1/4W ±5% Resistor
	(R2,R3,R6,R7,R10,R11,R16,R42,R43,R46,R47,R50,R51,R54)
CHVU-24-26	470 Ohm 1/4W ±5% Resistor (R22,R24,R27,R29,R32,R34,R62,R64,R67,R69,R72,R74)
CHVU-21-77	1K Ohm 1/4W ±5% Resistor (R21, R26, R31, R61, R66, R71, R80~R89)
CHVU-24-27	2K Ohm 1/4W ±5% Resistor (R13, R20, R25, R30, R60, R65, R70)
CHVU-24-28	7.5K Ohm $1/4W \pm 5\%$ Resistor (R14)
CHVU-21-93	Octal 1K Ohm Series Resistor Array (RM1)
CHVU-22-58	16 Pin DIP IC Socket (S6~S11) 28 Pin DIP IC Socket (S1~S5)
CHVU-21-99 CHVU-21-101	28 Pin DIP IC Socket 10 Pin Connector Receptacle (S1~S5) (P1, P2)
CHVU-21-102	50 Pin Flat Cable Header (P3, P4)

H. 054-FCC PCB Assembly : PARTS LIST

PART No.	DESCRIPTION (Reference Designations)	
CHPU-23-01	054-FCC Complete PCB Assembly	
CHPU-23-11 CHPU-23-12 CHPU-23-13	252-28-50-168 56P Edge Connector 330 pf 50V Ceramic-Disc Capacitor Ferrite Beads BL 02RN2-R62	(C1~C30) (FC1~FC30)

PART No.	DESCRIPTION (Reterence Designations)	
CHPU-88-01 CHPU-88-02	PP-1000A Complete Power Supply Assessor 3D-0163 Complete Power Supply PCB	[[] [[[[[[[[[[[[[[[[[
CHPU-88-11 CHPU-88-12 CHPU-88-13 CHPU-88-14 CHPU-88-15 CHPU-88-16 CHPU-88-17 CHPU-88-19 CHPU-88-20 CHPU-88-21 CHPU-88-21 CHPU-88-22 CHPU-88-23 CHPU-88-24	3D-3000 Hybrid IC uPC78M24 3-Terminal Regulator TL431CLP Adjustable Shunt Regulator TLP541G Photo Coupler PC614 Photo Coupler RB404/S4VB40 Diode C25P04Q/20CS04M Diode 30DF2 Diode 1S1835/10DF6 Diode 1S954 Diode RD5. 1EB3 Zener Diode 5P2M Thyristor 2SC2562 Silicon NPN Transistor 2SC2749 Silicon NPN Transistor	(IC1) (IC2) (IC3) (PC1) (PC2) (D1) (D12) (D11) (D6, D7, D10, D14) (D3) (ZD1) (Q1) (Q2) (Q3)
CHPU-88-25 CHPU-88-26 CHPU-88-27 CHPU-88-28 CHPU-88-29 CHPU-88-30 CHPU-88-31 CHPU-88-32 CHPU-88-33 CHPU-88-35	0.01 uf 50V Mylar Capacitor 0.1 uf 50V Mylar Capacitor 1000 pf 50V Mylar Capacitor 0.047 uf 630V Metallized Film Cap. 0.22 uf 250V Metallized Film Cap. 2200 pf 2KV Ceramic-Disc Capacitor (Cap. 4.7 uf 50V AI Electrolytic Cap. 47 uf 35V AI Electrolytic Cap. 330 uf 200V AI Electrolytic Cap. 1000 uf 50V AI Electrolytic Cap. 3300 uf 10V AI Electrolytic Cap.	(C6, C9, C27) (C13) (C12) (C1, C4) (C10, C28, C29) (C2,C3,C11,C15,C18) (C7) (C8, C17) (C5) (C16) (C19~C26)
CHPU-88-36 CHPU-88-37 CHPU-88-39 CHPU-88-40 CHPU-88-41 CHPU-88-42 CHPU-88-43 CHPU-88-44 CHPU-88-45 CHPU-88-45 CHPU-88-46 CHPU-88-47 CHPU-88-48 CHPU-88-50 CHPU-88-50 CHPU-88-51 CHPU-88-51 CHPU-88-52	100 Ohm 1/4W ±5% Carbon Resistor 1K Ohm 1/4W ±5% Carbon Resistor 1.5K Ohm 1/4W ±5% Carbon Resistor 2.4K Ohm 1/4W ±5% Carbon Resistor 10K Ohm 1/4W ±5% Carbon Resistor 24K Ohm 1/4W ±5% Carbon Resistor 30K Ohm 1/4W ±5% Carbon Resistor 30K Ohm 1/4W ±5% Carbon Resistor 5.1 Ohm 1/2W ±5% Carbon Resistor 100 Ohm 1/2W ±5% Carbon Resistor 100K Ohm 1/2W ±5% Carbon Resistor 100K Ohm 1/2W ±5% Carbon Resistor 20 Ohm 5W ±5% Cement Resistor 20 Ohm 5W ±5% Cement Resistor 30 Ohm 5W ±5% Cement Resistor 100 Ohm 5W ±5% Cement Resistor	(R4, R6, R15) (R25)
CHPU-88-53	EI-40 Type 3D-0163 Switching Transfor	mer (TR)

PART No.	DESCRIPTION (Reference Designations)	
CHPU-88-54 CHPU-88-55 CHPU-88-56 CHPU-88-57 CHPU-88-58 CHPU-88-60 CHPU-88-61 CHPU-88-61 CHPU-88-62 CHPU-88-65	SC2A Choke Coil SF-C27-00105-01 Choke Coil 3A FGMB NR Type Fuse OG751-0062 Fuse Holder (2 per assembly) Heat Sink Clip (3 per assembly) Thermally Conductive Rubber 2-Pin AC Input Connector Receptacle on PCB 6-Pin DC Output Connector Receptacle on PCB 7-Pin DC Output Connector Receptacle on PCB 3D-0163-32 Type Heat Sink	(L1) (L2)
CHPU-88-63 CHPU-88-64 CHPU-88-66 CHPU-88-67 CHPU-88-68 CHPU-88-69	3D-0163-30 Type Metal Frame 3D-0163-31 Type Metal Cover 3-Pin AC Input Connector Ass'y. on Metal Frame 9-Pin DC Output Connector Ass'y. on Metal Frame 12-Pin DC Output Connector Ass'y. on Metal Frame Metal PCB Retainer (4 per assembly)	

J. CHV1-UP Fuses

PART No.	DESCRIPTION(Reference	Designations)	
TKGU-11-08	Main Fuse U.S.	5A 125V	
CHVU-63-11	Main Fuse Europe	3A 250V	
CHPU-88-56	Power Supply Fuse	3A 125V(Midget)	
TKGU-11-12	Video Monitor Fuse		
	20-EZV(R-C), 20-Z2AW	4A 125V(Slow Blow)	(F302)
TKGU-11-13	Video Monitor Fuse		(=00)
	20-EZV(R-C), 20-Z2AW	0.3A 125V(Midget)	(F301)
MDST-63-12	Video Monitor Fuse		
	XM-2001N	2.5A 125V(Slow Blow)	(F702)
MDST-63-13	Video Monitor Fuse		
	XM-2001N	3A 125V(Slow Blow)	(F701)

